
HomeEnergySaver Program

CONTRACTOR GUIDE TO THE NRCAN ASHP SIZING AND SELECTION TOOL

BEFORE YOU BEGIN

Please review the available [Toolkit For Air Source Heat Pump Sizing and Selection](#) on the NRCan website. The webpage includes links to download the ASHP Sizing and Selection Tool workbook and a [YouTube video](#) on how to use the Sizing and Selection Tool.

This guide can help you check for accuracy and completeness of the ASHP Sizing and Selection Tool workbook before you or your customer (the Participant) uploads it to the Pre-Installation Form. It covers the fields that should be completed for the HomeEnergySaver Program, helpful suggestions on where to get the required inputs, and how to interpret them for your sizing exercise. If the Application Review team discovers an error or missing information in the workbook, the Pre-Installation Form will be marked as "Incomplete," and the Application Review team will ask that the Participant and the Contractor update the workbook with the correct information.

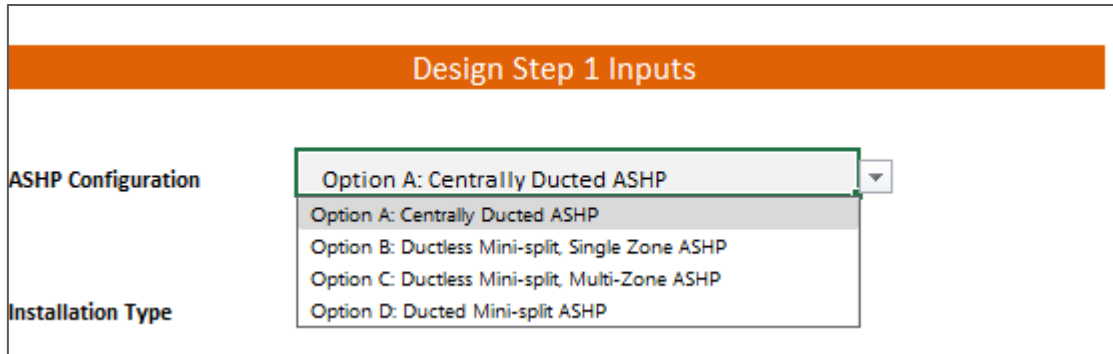
NOTES ON OPENING THE WORKBOOK

When opening the ASHP Sizing and Selection Tool workbook, you will see a pop-up that says, "Microsoft has blocked macros from running because the source of this file is untrusted." Please click "Ok" and proceed — this does not affect the functionality of the workbook.

You may receive another pop up that reads, "Important: In order to allow the tool to operate optimally, it is preferable to close any other Excel file currently open." You may also click "Ok" to proceed.

SHEET 1

- Ensure that the ASHP Configuration matches the AHRI sheet:

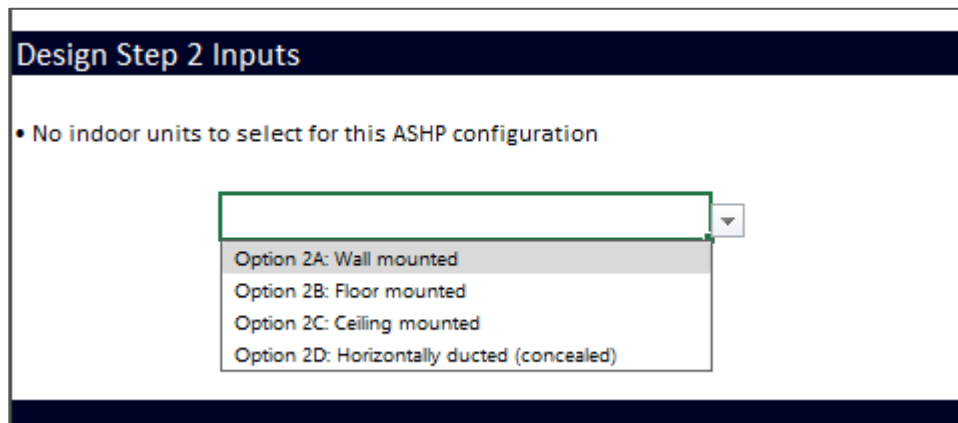


The screenshot shows a form titled "Design Step 1 Inputs". It has two main sections: "ASHP Configuration" and "Installation Type". The "ASHP Configuration" dropdown menu is open, showing four options: "Option A: Centrally Ducted ASHP", "Option B: Ductless Mini-split, Single Zone ASHP", "Option C: Ductless Mini-split, Multi-Zone ASHP", and "Option D: Ducted Mini-split ASHP". The "Installation Type" dropdown menu is not open.

- Enter the number of units that will be installed.
- Select the Installation Type.

SHEET 2

- Select the appropriate ASHP configuration:



The screenshot shows a form titled "Design Step 2 Inputs". It contains a message: "• No indoor units to select for this ASHP configuration". Below the message is a dropdown menu with four options: "Option 2A: Wall mounted", "Option 2B: Floor mounted", "Option 2C: Ceiling mounted", and "Option 2D: Horizontally ducted (concealed)".

SHEET 3

- Verify that the Province and City match the application.
 - Note: the workbook does not have a comprehensive list of cities and towns. If the participant's city/town is unavailable, please select an available city or town that is closest to the participant's home.
- Select the Load Determination Method.
 - We anticipate that "Option D: Loads Estimate from Existing Equipment Capacities" will be the most popular option.

- If selecting "Option D: Loads Estimate from Existing Equipment Capacities," you must fill out two additional fields: "Existing Comfort Issues/Recent Home Upgrades?" and "Assumed Over-Capacity Sizing of Existing Equipment." More information can be found in pages 14-19 of [NRCAN's ASHP Sizing and Selection Guide](#).
- Ensure that the "Heating Equipment Rated Heating Output" and "Cooling Equipment Rated Heating Output" are appropriate based on the "Total Heated Area" input.
- Select the "House Type" and "Built in Between" year range.
- This sheet also contains a section at the bottom that calculates the maximum airflow capacity of the existing ducts using the ducting geometry and guidance from HRAI. This information can also assist in determining the appropriate heat pump model best suited for the home.

SHEET 4

- Per the program requirements, the sizing approach must be "Option C: Emphasis on Heating" or "Option D: ASHP as Sole Heating Source":

Design Step 4 Inputs	
Sizing Approach	Option C: Emphasis on Heating
Full System Replacement?	

SHEET 5

- We recommend completing this sheet with three heat pump models to compare which model is the most appropriate fit for the home.
 - Ensure that information for at least one heat pump is accurate and reflects the AHRI sheet.
 - The AHRI and model numbers on the quote must also match the information entered here.
- Ensure all cells are populated and that "HP Type" is selected for each heat pump case. Information required to populate this section can be found on the Northeast Energy Efficiency Partnerships database (<https://ashp.neep.org/>).

Performance Specs

Heating / Cooling	Outdoor Dry Bulb	Indoor Dry Bulb	Unit	Min	Rated*	Max
Cooling	95°F	80°F	Btu/h*	1,023	12,000	16,900
			kW	0.4	0.97	1.71
			COP	0.75	3.63	2.9
Cooling	82°F	80°F	Btu/h*	1,023	-	16,940
			kW	0.3	-	1.41
			COP	1	-	3.52
Heating	47°F	70°F	Btu/h*	1,023	13,600	22,180
			kW	0.2	1.04	1.97
			COP	1.5	3.83	3.3
Heating	17°F	70°F	Btu/h*	603	8,200	13,340
			kW	0.3	0.84	1.48
			COP	0.59	2.86	2.64
Heating	5°F	70°F	Btu/h*	450	-	11,930
			kW	0.29	-	1.47
			COP	0.45	-	2.38
Heating	-4°F	70°F	Btu/h*	380	-	10,360
			kW	0.3	-	1.36
			COP	0.37	-	2.23

- Above is an example of the performance specs data for a single stage heat pump. If you are inputting a variable or two-stage HP Type, enter the max and min specifications for High and Low stage respectively.
- Specifically, you will want to look at the Rated outputs, powers, and COPs for each of the respective temperatures.

Information Tables	
Brand	LG
Series	
Ducting Configuration	Singlezone Non-Ducted, Wall Placement
AHRI Certificate #*	10570123
Outdoor Unit Model #*	LSU120HSV5
Indoor Model #*	LSN120HSV5
Indoor Unit Type*	Mini-Splits
Furnace Model* #	
EER*	12.5
SEER*	22.7

- The EER can also be found on this page if required.

Heat Pump Inputs

Global Information	Data Entry Type	Performance Data																																																						
<p>Heat Pump #1</p> <p>Reference Name: _____</p> <p>Indoor Unit Model Name: _____</p> <p>Outdoor Unit Model Name: _____</p> <p>Noise Rating [dB(A)]: _____</p> <p>Rated Airflow [CFM]: _____</p> <p>Cut-Off Temperature [°F]: _____</p> <p>HP Integration: Centrally Ducted</p> <p>HP Type: Variable</p> <p>UNIT OPTIONS HP#1</p> <p>Air Flow: CFM</p> <p>Temperature: °F</p> <p>Capacity: BTU/hr</p> <p>Reset button HP#1</p>	<p> <input checked="" type="checkbox"/> AHRI (47,17,95) <input type="checkbox"/> NEEP (47,17,5,95) <input type="checkbox"/> Manufacturer Extended Data <input type="checkbox"/> Exploratory Curves </p> <p> Heating Power/COP: COP Cooling Power/EER: EER </p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="3">High Stage</th> </tr> </thead> <tbody> <tr> <td style="background-color: #f0f0f0;">HEAT</td> <td>Temperature [°F]</td> <td>47 17</td> </tr> <tr> <td style="background-color: #f0f0f0;">HEAT</td> <td>Heating Cap. [BTU/hr]</td> <td></td> </tr> <tr> <td style="background-color: #f0f0f0;">HEAT</td> <td>Heating COP [-]</td> <td></td> </tr> <tr> <td style="background-color: #f0f0f0;">HEAT</td> <td>Heating Power [kW]</td> <td></td> </tr> <tr> <td style="background-color: #e0e0e0;">COOL</td> <td>Temperature [°F]</td> <td>95</td> </tr> <tr> <td style="background-color: #e0e0e0;">COOL</td> <td>Cooling Cap. [BTU/hr]</td> <td></td> </tr> <tr> <td style="background-color: #e0e0e0;">COOL</td> <td>Cooling EER [-]</td> <td></td> </tr> <tr> <td style="background-color: #e0e0e0;">COOL</td> <td>Cooling Power [kW]</td> <td></td> </tr> <tr> <th colspan="3">Low Stage</th> </tr> <tr> <td style="background-color: #f0f0f0;">HEAT</td> <td>Temperature [°F]</td> <td>47 17</td> </tr> <tr> <td style="background-color: #f0f0f0;">HEAT</td> <td>Heating Cap. [BTU/hr]</td> <td></td> </tr> <tr> <td style="background-color: #f0f0f0;">HEAT</td> <td>Heating COP [-]</td> <td></td> </tr> <tr> <td style="background-color: #f0f0f0;">HEAT</td> <td>Heating Power [kW]</td> <td></td> </tr> <tr> <td style="background-color: #e0e0e0;">COOL</td> <td>Temperature [°F]</td> <td>95</td> </tr> <tr> <td style="background-color: #e0e0e0;">COOL</td> <td>Cooling Cap. [BTU/hr]</td> <td></td> </tr> <tr> <td style="background-color: #e0e0e0;">COOL</td> <td>Cooling EER [-]</td> <td></td> </tr> <tr> <td style="background-color: #e0e0e0;">COOL</td> <td>Cooling Power [kW]</td> <td></td> </tr> </tbody> </table>	High Stage			HEAT	Temperature [°F]	47 17	HEAT	Heating Cap. [BTU/hr]		HEAT	Heating COP [-]		HEAT	Heating Power [kW]		COOL	Temperature [°F]	95	COOL	Cooling Cap. [BTU/hr]		COOL	Cooling EER [-]		COOL	Cooling Power [kW]		Low Stage			HEAT	Temperature [°F]	47 17	HEAT	Heating Cap. [BTU/hr]		HEAT	Heating COP [-]		HEAT	Heating Power [kW]		COOL	Temperature [°F]	95	COOL	Cooling Cap. [BTU/hr]		COOL	Cooling EER [-]		COOL	Cooling Power [kW]	
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- Above is a screenshot from the ASHP Sizing and Selection Tool that indicates where to input the data found on the NEEP website. Additionally, it highlights where you can swap between Heating/Cooling Power to COP/EER.
- The Cooling Output “% of Design” represents the fraction of the year the heat pump will meet the cooling load. The closer to 100% this field is, the less likely there will be a need for supplementary cooling equipment.
- The Fraction of Heating above t-BPT (thermal balance point temperature) represents the fraction of the year the heat pump will meet the heating load of the home. Option C indicates that there is

an Emphasis on Heating savings whereas Option D mentions the Air Source Heat Pump as the Sole Heating Source and as such, the percentage should be much closer to 100% for Option D.

- Please note that sometimes a program-verified heat pump is not found on the NEEP database. In this situation, you can find the required data in the heat pump submittal sheet.

Outputs			
	Heat Pump #1	Heat Pump #2	Heat Pump #3
Design Loads (Step 3)	Heating: 28800 BTU/hr at -13°F Cooling: 19200 BTU/hr at 84°F	Heating: 28800 BTU/hr at -13°F Cooling: 19200 BTU/hr at 84°F	Heating: 28800 BTU/hr at -13°F Cooling: 19200 BTU/hr at 84°F
Sizing Option (Step 4)	Option C: Emphasis on Heating	Option C: Emphasis on Heating	Option C: Emphasis on Heating
Selected HP Staging; Heat Capacity; Cool Capacity (Step 5)	Regular Variable; 13600 BTU/hr; 12000 BTU/hr	Regular Variable; 21600 BTU/hr; 18000 BTU/hr	Regular Variable; 24000 BTU/hr; 21200 BTU/hr
Heat Pump Cut-Off Temperature	-13°F	-13°F	-13°F
High Stage Cooling Output at Tdesign,Cool (% of Design)	12000 BTU/hr (63%)	18000 BTU/hr (94%)	21200 BTU/hr (110%)
Thermal Balance Point Temperature (t-BPT) (?)	31°F	21°F	18°F
Fraction of Heating above t-BPT	40%	61%	66%
Low Stage Cooling Output at Tdesign,Cool (% of Design)			
Thermal Balance Point Temperature (t-BPT) (?)			

SHEET 6

This is for informational purposes only.

- Select the correct heat pump (1-4).
- Select "Option A1: ASHP Cut-Off Temperature" under "Control Strategy."
- Verify that "Electricity" is selected as the "Fuel Type".
- Add all additional fuel information. This sheet can be used to compare economic benefits in the "GHG, Cost, Energy Use" section for the different heat pump scenarios and for the selected backup heating arrangement.

The following sections are not required for participation in the HomeEnergySaver Program. However, they can provide some useful information.

REMAINING SECTIONS – NOT MANDATORY

BACK-UP HEATING SHEET

This sheet can help you determine if additional backup heating for the home or zone should be considered.

- Select the oversize factor for the backup heating system: 1.0-1.4 – 100%-140%.
 - Pages 41 to 43 in the [NRCAN ASHP Sizing and Selection Guide](#) provide detailed information on how to determine if the backup heating system should be oversized compared to the design heat load.

CHECKS AND REMINDERS SHEET

This sheet includes general project reminders. For example, assessing if the electrical panels require updating.

- Select if the Central Cooling System or Heat Pump is being replaced.
 - If “yes” is selected, the sizing tool will indicate “If the heat pump being selected exceeds the nominal capacity of the existing air conditioner or heat pump, the user should ensure that the existing electrical panel has a sufficient amperage rating available for the heat pump.”

GHG, COST, ENERGY USE SHEET

This sheet is useful for economic, GHG, and energy usage comparisons between different heat pump scenarios and the backup heating system.

- No inputs are required here.

SUMMARY SHEET

This is a summary of the selected heat pump in Sheet 6.

- No inputs are required here. This is an informational page only.

ADDITIONAL RESOURCES

The below list contains additional resources that can help your customer choose the right heat pump for their home. Contractors are welcome to download, print, and share these materials with their customers.

Sizing Guide: <https://saveonenergy.ca/-/media/Files/SaveOnEnergy/training-and-support/hvac/ASHP-Sizing-Selection-Guide.pdf>

Info Sheet: <https://saveonenergy.ca/-/media/Files/SaveOnEnergy/training-and-support/hvac/ASHP-Pre-Install-Guide.pdf>

Buying Guide: <https://saveonenergy.ca/For-Your-Home/Advice-and-Tips/ASHP-Guide>

NEED HELP?

If you have questions about the HomeEnergySaver program or how to apply, please reach out to our Contact Centre team by calling 1-888-795-3352 or emailing info@hesprogram.ca.